

CLAIMS

1. A data communication apparatus having a memory space, the data communication apparatus managing the memory space by separating the memory space into one or more file systems, the apparatus comprising:

controlling means for holding a separating authority key and managing the access to the file system in the memory space; and

a first file system allocated to a first service provider in the memory space, the first file system holding an issuer key of the first service provider;

wherein, upon receiving, from a second service provider requesting an allocation of a new file system, a separate package generated by encrypting, using the issuer key of the first service provider, a data block containing a separate element package generated by encrypting an issuer key of the second service provider using the separating authority key and information on the new file system, the first file system decrypts the received separate package using the issuer key of the first service provider and retrieves the separate element package and the information on the new file system, and wherein the controlling means decrypts the separate element package using the separating authority key, retrieves the issuer key of the second service provider,

separates a free area of the memory space in accordance with the information on the new file system, and allocates the separated memory area to a second file system holding the issuer key of the second service provider.

2. The data communication apparatus according to Claim 1, wherein each of the file systems in the memory space has area identification information, and wherein, upon receiving an external access having the area identification information on a file system to be accessed and a package encrypted using the issuer key of the file system in the form of arguments of the external access, the controlling means delivers the package to the corresponding file system on the basis of the area identification information, and wherein the file system decrypts the package using the issuer key of the file system.

3. The data communication apparatus according to Claim 2, wherein each of the allocated file systems in the memory space has a system code, and wherein, when separating a new file system in response to the reception of the separate package, the controlling means sets the system code of the file system together with the issuer code and the area identification information.

4. The data communication apparatus according to Claim 3, wherein, when the service provider issues a request for acquiring area identification information using the system code of the service provider as an argument of the request after acquiring the file system, the controlling means performs polling on each of the file systems on the basis of the system code in the request to acquire the area identification information from the corresponding file system and returns the acquired area identification information to the requester.

5. The data communication apparatus according to Claim 3, wherein, in response to a request from the second service provider after the second service provider has acquired the file system, the controlling means rewrites the issuer key and the system code set in the second file system at the separating time.

6. The data communication apparatus according to Claim 1, wherein each of the file systems in the memory space has area identification information, and wherein, upon receiving, from the service provider after the service provider has acquired the file system, an external access having the area identification information and a package of an access request to the file system encrypted using the issuer key of

the service provider in the form of arguments of the external access, the controlling means delivers the encrypted package to the corresponding file system on the basis of the area identification information.

7. A method for managing a memory of a data communication apparatus, the data communication apparatus having a memory space and managing the memory space by separating the memory space into one or more file systems, wherein a separating authority key for authenticating authority to separate the file system and a first file system for authenticating access authority using an issuer key of a first service provider are provided in the memory space, the method comprising the steps of:

receiving, from a second service provider requesting an allocation of a new file system, a separate package generated by encrypting, using the issuer key of the first service provider, a data block containing a separate element package generated by encrypting an issuer key of the second service provider using the separating authority key and information on the new file system;

decrypting the received separate package using the issuer key of the first service provider and retrieving the separate element package and the information on the new file system; and

decrypting the separate element package using the separating authority key, retrieving the issuer key of the second service provider, separating a free area of the memory space in accordance with the information on the new file system, and allocating the separated memory area to a second file system holding the issuer key of the second service provider.

8. The method for managing a memory of a data communication apparatus according to Claim 7, wherein each of the file systems in the memory space has area identification information, and wherein an external access includes the area identification information on a file system to be accessed and a package encrypted using the issuer key of the file system in the form of arguments, and wherein the method further comprises the steps of receiving an external access request to the file system having area identification information and a package as arguments of the external access request, delivering the package to the corresponding file system on the basis of the area identification information, and decrypting the package using the issuer key of the file system by the file system.

9. The method for managing a memory of a data communication apparatus according to Claim 8, wherein each

of the allocated file systems in the memory space has a system code, and wherein the method further comprises the steps of setting the system code of the file system together with the issuer code and the area identification information when separating a new file system in response to the reception of the separate package.

10. The method for managing a memory of a data communication apparatus according to Claim 9, further comprising:

issuing, from the service provider, a request for acquiring area identification information using the system code of the service provider as an argument of the request after acquiring the file system; and

performing polling on each of the file systems on the basis of the system code in the request to acquire the area identification information from the corresponding file system and returning the acquired area identification information to the requester.

11. The method for managing a memory of a data communication apparatus according to Claim 9, further comprising the steps of issuing, from the second service provider, a request for rewriting the issuer key and the system code set in the second file system at the separating

time after the second service provider has acquired the file system of the second service provider in the memory space and rewriting the issuer key and the system code set in the second file system at the separating time in response to the rewriting request.

12. The method for managing a memory of a data communication apparatus according to Claim 7, wherein each of the file systems in the memory space has area identification information, and wherein the method further comprises the steps of receiving, from the service provider, an access request including the area identification information and a package of an access request to the file system of the service provider encrypted using the issuer key of the service provider in the form of arguments of the access request after the service provider has acquired the file system, and delivering the package to the corresponding file system on the basis of the area identification information contained in the arguments of the access request from the service provider.